

Articles

“Planting Education”: education and sustainability in the territories of the Brazilian Amazon

“Plantar Educação”: educação e sustentabilidade nos territórios da Amazônia brasileira

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Abstract

The Amazon Forest has great biocultural richness, with a diversity of plants, peoples, languages, and cultures, but these are under constant threat due to development projects implemented by the Brazilian state and the capitalist agribusiness economy, as well as mining and illegal logging. To respond to these challenges in the Amazon, we present the experience of the *Programa Plantar Educação* (Planting Education Program), which involves municipalities in the states of Amazonas and Pará, with the aim to support local systems in developing educational strategies which promote higher quality in basic education, committed to the region, the place, and the territories. This experience has brought important results in the organization, planning, and monitoring of local education systems, with the participation of public managers, teachers, students, and community members in the process of developing pedagogical strategies which resonate with people’s ways of life.

Keywords: environmental education; public education policies; Amazon.

Resumo

A Amazônia tem uma grande riqueza biocultural, com uma diversidade de plantas, povos, línguas e culturas, mas que estão em constante ameaça devido aos projetos de desenvolvimento que foram implantados pelo estado brasileiro, pela economia capitalista do agronegócio, pelo garimpo e pela exploração madeireira ilegal. Para responder a esses desafios da Amazônia, apresentamos a experiência do “Programa Plantar Educação”, que envolve municípios dos estados do Amazonas e Pará, com o objetivo de apoiar os sistemas locais no desenvolvimento de estratégias educativas que promovam mais qualidade na educação básica, comprometidas e referenciadas pela região, com o local e os territórios. A experiência tem trazido resultados importantes na organização, planejamento e monitoramento dos sistemas locais de educação, com a participação de gestores, professores, estudantes e comunitários do processo de elaboração de estratégias pedagógicas que dialoguem com o lugar e o modo de vida das pessoas.

Palavras-chave: educação ambiental; políticas públicas de educação; Amazônia.

INTRODUCTION

The Amazon Forest occupies 60% of the Brazilian territory and is home to 14% of its population, which generates great biocultural richness, and which considers the diversity of life in its human-environmental dimensions, including biological, socio-cultural and linguistic diversity, which are interlinked and organized as socio-environmental systems (Painel Científico para a Amazônia, 2021). Nevertheless, data from the *Relatório Amazônia Viva* (Alive Amazon Report) (Vergara et al., 2022) indicate that its richness is in danger and the biome is facing destruction, disconnection and degradation processes on a large scale, caused by the warming caused

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Study conducted in the Amazon, covering the states of Amazonas and Pará.



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by the human being, by means of extensive agriculture and livestock farming, illegal mining, land grabbing, illegal timber extraction and illegal hunting. It is important to highlight that the Amazon Forest is an important provider of eco-systemic services, with its rich biodiversity, carbon sequestration and regulation of water and nutrient cycles (Börner; Mendoza; Vosti, 2007). Therefore, there is no doubt that it is urgent to think of Amazon's sustainability in relation to its people and their ways of living.

Data from the *Pesquisa Nacional por Amostra de Domicílio* (National Household Sample Survey)/ PNAD (Instituto Brasileiro de Geografia e Estatística, 2022) indicate that the Amazonian region has 60% more children aged between 6 and 14 years old out of school than the Brazilian average. It also points to the fact that 7.6% of the students enter their 15 years without knowing how to adequately read and 1 in every 5 youths in the Amazon do not study, nor work, well above the national average (which is about 1 in every 13).

The challenges in the quality of the education offered in the Amazon do not prevent the progress of illegal activities and make this environment even more critical, with a growing movement of youths engaging in illegal works, motivated by the lack of perspectives and opportunities in the region. This scenario demonstrates that the challenges of education in the region have important implications to the socio-environmental sustainability of the region, and consequently, all of the country.

The debates about the idea of education as a path for sustainability, defined in the discussions carried out in the decades of 1980 and 1990, and systematized the international pacts and documents, criticize the conventional development models, and assign to education the great responsibility of articulating economic and social progress with environmental protection.

In the great responsibilities directed to education as a promoter of sustainable development, the contradiction and ambiguity which still exists among the terms development and sustainability are apparent (Feil; Schreiber, 2016). What we know is that the current economic models are incompatible with sustainability, and the very term "sustainable development" is polemic and confusing regarding means and ends (Newton; Freyfogle, 2005).

The rhetoric of a pragmatic speech focused only in propagating the importance of sustainable development and the role of education in this context, amplifies even more the complexity of articulating such themes, given that education is not the only solution and must be integrated to a set of efficient public policies (Bastos; Souza, 2013), in which there is convergence between economy, ecology, cultural anthropology and political science (Sachs, 1993 *apud* Bastos; Souza, 2013).

What the latest events related to the extreme climatic events in the region demonstrate is that the current dominant models of economic development are incompatible with the traditional and ancestral ways of living present in the Amazonian region. We need new development perspectives, since the current paradigms have been harmful to the existence of Amazonian populations, and education for sustainability must, above all, strengthen the ways of life which ensure the forest stands.

In Brazil, the *Base Nacional Comum Curricular* (National Curricular Common Base) defines seven competences on which, at the end of basic education, the students must be capable of arguing based on reliable facts, data and information. The competences must help the formulation, negotiation and defense of ideas, points of view and common decisions which respect and promote human rights, environmental conscience and responsible consumption in local, regional and global levels. Lastly, reinforcing the ethical positioning in relation to the care of oneself, others and the planet (Brasil, 2017).

The approach for the accomplishment of this competence takes place by means of the contemporary transversal themes, which must be included in the curriculum as flexible contents, which may be ministered under different approaches and by several areas of knowledge. Thus, the contemporary social theme of the environment encompasses two axes: Environmental Education and Education for Consumption. Such approach reduces the discussions of education to more restricted contexts of consumer societies, ignoring the practices and knowledge of Amazonian populations, notably, providers of eco-systemic services to the world.

EDUCATION AND SUSTAINABILITY: DEBATES AND POSSIBILITIES

The relation between Education and Sustainability has several conceptions and interpretations, based on the exercise of environmental education which is expressed in the scope of the curricula of basic education, but which, at times, is restricted to knowledge on ecological principles and models decontextualized from the amazonian territory. Many studies and investigations face challenges in regard to the definition of a concept of education for sustainability in/for the Amazon, but may provide us possible paths for the construction of a work which manages to capture the education practices for sustainability in/for the Amazon in basic education.

Thereby, this brief review has the aim of understanding the reflections and studies developed in different territories which may be applied and utilized to interpret the amazonian reality. The studies draw us closer to the main challenges in the relation between education and sustainability in the region, giving subsidies to a set of desires, beliefs, ideas, values which are practiced (or not) in the schools.

Two studies (Santana, 2021; Esperanza; González Gaudiano, 2009) on social representation of teachers about the environment and nature, carried out in different countries, Brazil and Mexico, showed that the environmental perceptions of these teachers still feature a superficial knowledge, based on emotions and guesswork, with little theoretical-conception foundation. The studies demonstrate that the predominant representations among the teachers reduce the environmental problem to its physical dimension. Few cases in which the teachers presented a more social and critical relation regarding the issue of nature were found.

Another study of qualitative approach, carried out in Paraná, in 2021, carried out by Vasconcelos and Frasson-Costa (2022) investigated the perceptions of the teachers on the early years of primary school in what pertains to *Educação Ambiental Emancipatória* (Emancipatory Environmental Education) (EAE) and to the concepts of *Ciência, Tecnologia, Sociedade e Ambiente* (Science, Technology, Society and Environment) (CTSA). The results demonstrated that the teaching in the classrooms does not reproduce the concepts of the documents which govern the training of teachers in Environmental Education, maintaining a reductionist perspective distant from the emancipatory perspective.

Two studies, one carried out in the amazonian context, by Cabral et al. (2023) and another in the Brazilian Northeast (Mota Júnior; Santos; Jesus, 2016), with high school educators about Environmental Education, show that there is a predominance of a conservationist and pragmatic view of nature and the concept of sustainability. The results show that, for the implementation of an Environmental Education which mobilizes for change, it is necessary to recognize that humans are a part of nature and not those who hold its mastery. Thus, it is necessary to problematize the anthropocentric view which dominates the debate and the legislation in relation to nature, in the sense of promoting a view of ecocentric nature (Lourenço, 2019).

The theme of environmental education, which should be transversal in elementary school, does not happen in practice, especially in subjects such as mathematics and portuguese, for the pedagogical proposal does not include approaches within the environmental theme (Ferreira et al., 2019). For this reason, Environmental Education is made necessary, aiming for sustainability to be effectively transversal in school curricula, giving emphasis to the contextualization of social and political issues for the development of the competences and skills necessary for the construction of leaderships which promote sustainability in education.

The results of the researches point to a pattern when it comes to education for sustainability, highlighting that many of the representations, perceptions and practices are still carried out in a fragmentary manner, based in personal opinions, with a simplistic view of reality, and reduce education for sustainability to theoretical knowledge on physical matters of the environment.

The conclusions of these studies suggest the need for the elaboration of plans which involve the discussions and debates aimed at the theme of environmental education in initial education and continued training of teachers. Another aspect is the reformulation of curricula both in the education of teachers and in basic education. There is the challenge of overcoming the view of nature as a physical environment, for a historical, social and political dynamic.

Another aspect which is absent from the studies is the discussion on the very concept of development practiced, since the 1960s, in the Amazon, which promotes a model which is opposed to nature (Schweickardt, 2012). The etymology of the word development brings in itself a criticism, for the Portuguese word for development - *desenvolvimento*, formed by the negative prefix *des-* and *envolvimento*, meaning “involvement” - brings the meaning of “non-involvement” or “without involvement” with the environment, “producing a dissociation between the ways of life and the issues of the surroundings”¹ (Maciel et al., 2022). Lastly, dealing with development/no-involvement is an imperative for the debate on sustainability and an emancipatory and contextualized education, the only possibility for it coming to be constituted as environmental education.

THE “PLANTING EDUCATION” EXPERIENCE: QUALITY EDUCATION AS A PROPELLANT OF EDUCATION FOR SUSTAINABILITY

In *Amazônia Legal*² (Legal Amazon), we have 14% of the Brazilian population distributed in a vast territory of urban zones, and rural zones characterized by fields, rivers and forests. Of the 27.8 million inhabitants (Instituto Brasileiro de Geografia e Estatística, 2022), approximately 5.2 thousand are students who are distributed in over 38 thousand schools, which are mostly governed by state and municipal governments.

School is, at times, the only public service present in remote localities of the Amazon, where there is a shortage or lack of structures of public facilities for the protection and guarantee of wellbeing to the populations. It is also at school where the impact in the students’s lives, from the threats resulting from illegal and unsustainable economic activities is felt, especially the expansion of the agribusiness and illegal mining in indigenous lands and protected areas.

In this scenario, it requires effort and resilience from the *Secretarias Municipais de Educação* (Municipal Departments of Education) for the implementation of quality educational policies, contextualized to the characteristics from the territory and populations in the Amazon. Moreover, there is a challenge which is the construction of educational strategies with the participation of their peoples and which are adequate to the characteristics of the amazonian liquid territory, which is determined by the water cycle (Schweickardt et al., 2016, 2019). In addition, it is also necessary to identify the risks and vulnerabilities, anticipatedly, for natural events we already know, also for the climatic changes which generate the severity of natural phenomena, to the example of the biggest drought in 2023 (Lima, 2024).

In the year of 2021, the *Plantar* program begins its ideation and planning stage, having as a premise the value of the Amazon standing, for the maintenance of the life and existence of the local populations. The initial discussions began from the idea of public, comprehensive, quality education respectful of local values, as a path and condition for sustainability. To this end, the co-construction of an educational program in/for the Amazon, which valued the active participation of the local community, strengthened the connection and sense of belonging of the students and teachers with the amazonian region’s history, present and future, was important. The discussion became visible to the need of a program which specifically emphasized in the amazonian identity, in the sustainability principles and in the improvement of the public education indexes, by means of support to local leaderships to generate relevant knowledge to the region.

Based on these discussions, *Plantar Educação* (Planting Education) was born, an educational program developed by researchers from the amazonian region in partnership with some third sector organization and municipal *Redes de Educação* (Educational Networks) from the states of Amazonas and Pará. The program’s initial design springs from the desire to contribute to the facing of environmental challenges of the region and its multiple challenges. The initial finding is that the Amazon images refer to a green mass, the forest and biodiversity. Thus, there is the misunderstanding that this biome, of immense diversity of trees in different shades of

¹ “Produzindo uma dissociação entre os modos de vida e as questões do entorno”

² *Amazônia Legal*, which can be translated to Legal Amazon, refers to a specific geographical region in Brazil that encompasses the Amazon rainforest and surrounding areas, defined by the Brazilian government for purposes of environmental, economic, and development policies.

green, only exists due to the interaction between different human societies, its cultures and means of life with this territory.

Thus, we understand that education as a public policy has a great capillarity and potential for the establishment of citizenship and engagement with the territory, promoting significant educational processes for and in the Amazon. Consequently, the curricula and pedagogical practices need a collective and participatory organization, having the experiences, livings and identities in the Amazon as a foundation. We understand that emancipatory education has a lot to contribute to the conservation and protection of the biome, with the commitment and engagement from its population.

Thus, the *Plantar Educação, para colher árvores* (Planting Education, to reap trees) program seeks to promote a relationship, an involvement from the people with the place in which they live. The initial purpose was the promotion of forest conservation by means of the advancement of comprehensive educational performance, reducing educational inequalities, promoting sustainable livelihoods, and simultaneously recognizing cultural diversity and traditional knowledge. The program aims to improve educational performance, foster students's sense of belonging to the region, promote leadership, and engage school communities in the sustainability agenda and the socio-environmental challenges present in the region.

Initially designed and implemented by the *Instituto Gesto* (Gesto Institute) and professors from the *Universidade Federal do Amazonas* (Federal University of Amazonas), and later incorporated as one of the *Programas da Motriz* (formerly *Instituto Gesto e Vetor Brasil*), a third-sector organization that partners with state and municipal Departments of Education, the *Plantar* program has, over three years of work with municipal education networks in the interior of the Amazon, reached 45,000 students in five Amazonian territories. The first initiatives involved three municipalities in the State of Amazonas: Manicoré, Itacoatiara, and Presidente Figueiredo, and two in the State of Pará: the municipalities of Moju and Ulianópolis. These five territories are partners in the Program to build institutional capacity aimed at improving student learning, enabling quality education, and strengthening the work of public servants to create relevant and enduring public policies.

Plantar lasts four years in the partner territories, with an implementation cycle which includes diagnosis, strategic planning, implementation of strategies and actions, evaluation, and replanning. It works with various levels of direct and indirect influence on the technical teams of the Municipal Departments of Education, school principals, teachers, students, and local communities, with a focus on monitoring the initial and final years of elementary education.

The managers of the educational networks, in partnership with technicians and researchers, develop strategies to improve their pedagogical and administrative management, curricula focused on sustainability education, with emphasis on Amazonian socio-biodiversity, and on the professional development of educators, technicians, managers, and teachers. The strategies and actions developed from the diagnosis take into account the implementation of key educational policies and the definition of priority action areas within the scope of the partnership.

The educational network's journey in the Program is defined by work areas related to major themes and strategies which ensure better learning opportunities for students. In pedagogical management, the work areas include pedagogical monitoring, network-level assessment, teacher training, and curriculum. In administrative management, actions are carried out in partnership for goal setting and planning, budget management, data management, and organizational structure. As transversal areas, issues related to full education and sustainability are also addressed, assuming the potential of the territory and the pursuit of a more equitable education.

Thus, the work with educational networks seeks intersectionality with other municipal departments and civil society organizations, with shared and collaborative efforts in co-building solutions, producing knowledge, methodologies, and innovation in sustainability education. Ultimately, the aim is to strengthen the connection between students and the knowledge produced in and by the Amazon, engaging them in the construction of citizenship tied to the territorial experiences in the region.

By bringing the Amazon and its multiple relationships and diversity as lived experiences into the classroom, committed to meaningful public education for students in the region, the *Plantar* program and the involved education networks are building an effective and systemic

strategy to reinforce conservation efforts and strengthen community involvement in the conservation of the Amazon, based on improving the socially and environmentally referenced quality of education.

In the program's first year in the networks, Literacy Policies, Student Access, and Active Search policies were designed and implemented, as challenges related to these areas were heavily impacted by the Covid-19 pandemic. The policies created were connected to the challenges of implementation in the Amazonian territory, considering seasonality and the pedagogical challenges in the region, such as multigrade classrooms, itinerancy, multiple calendars, and others.

The territories of Moju and Ulianópolis, in the State of Pará, were the first to implement learning recovery actions through the programs *Pororoca da Aprendizagem* (Learning Pororoca) and *Germinar Saberes* (Sowing Knowledge). In this work area, the methodology used was TARL - Teaching at the Right Level (Banerjee et al, 2016; Amalia; Safrida; Ulva, 2024; Ismail et al., 2024), an evidence-based approach which conducts classroom teaching based on different learning levels of students, focusing on basic literacy and math skills and directed towards learning progression.

Alongside the pedagogical actions, there is strong activity in internal management within the educational networks, as is the case in the municipality of Ulianópolis, which defined macro-processes to improve management and the flow of actions conducted by the Department. All Municipal Departments of Education involved in the *Plantar* Program participate in the collaborative development of Strategic Planning and annually define the objectives they wish to achieve collectively. These management actions improve the technical capacity of the network to operate not only in the routine educational service, such as providing meals, using fuel for school transport, and allocating and supporting teachers, but also in monitoring quality based on student outcomes through the definition of shared learning goals.

Regarding learning goals, the networks conduct network-level assessments to monitor literacy and the development of learning in other stages of elementary education, reducing the invisibility which exists in multigrade classrooms, as many of these are not assessed by external evaluation systems due to not meeting the minimum number of students per level at the teaching unit. Along with these assessments, an Environmental Perception Assessment is also conducted, aiming to develop and scale mechanisms to measure students's knowledge, practices, and feelings regarding the Amazon, allowing the monitoring of the impact of initiatives aimed at promoting Amazonian citizenship.

Within the Program, the process of improving the quality of educational indicators is accompanied by innovation initiatives in education for sustainability. The innovations are based on three fundamental pillars: contextualized pedagogical practices, protagonism, and territory. These innovations are grounded in the idea that Amazonian students need to understand themselves and develop the ability to learn and grow in their territory, feeling like active and engaged participants in their community. Thus, teachers seek to expand learning spaces into physical and symbolic spaces of the territory, which include geography, social mapping, and relationships established in that space with contents and knowledge.

In this sense, the *Salas Florestas* (Forest Classrooms) Project was created in the municipality of Ulianópolis, also within the partnership between the municipality and the Plantar Program, with the goal of boosting the learning process through contextualized education for sustainability in rural schools in the municipality, based on teacher training for the pedagogical use of *Sistemas Agroflorestais* (Agroforestry Systems) (SAF). In 2023, 27 teachers were trained, with pedagogical support and the implementation of a SAF at a rural school in the city. In 2024, the methodology was transferred to the educational network with the training of guardians and reference trainers, with visible impacts on the creation of more contextualized and meaningful lesson plans for both students and teachers.

Within the same scope of innovation work, the *Guardiões do Amanhã* (Guardians of Tomorrow) Project, developed in the municipality of Itacoatiara, Amazonas, aimed at training young environmental agents in the Arari region, fostering local debates on sustainable development, and mobilizing student protagonism for activism and community participation. In the municipality of Manicoré, also in Amazonas, the *Bioeconomia e Currículo* (Bioeconomy and

Curriculum) project was developed, contributing to the identification of the aspirations of youth in integrating with the municipality's economic potential.

The sustainability education initiatives carried out in *Plantar* aim to create a space for dialogue and debate, so that children, youths, and adults in municipalities located in the heart of the Amazon understand and value their role in the conservation of the biome and in the adaptive processes needed in the face of ongoing climate changes. Through education strategies, they can explore their full potential sustainably. Finally, the partial results show that *Plantar* has planted the seeds for the formation of present and future leaderships committed to keeping the forest standing through educational processes socially and environmentally referenced in curricula and pedagogical practices.

FINAL CONSIDERATIONS

The journey of building an education program in/for the Amazon has been one of many discoveries and learnings, making the experience innovative in itself, as the teams work continuously, systematically, and in-depth alongside the partner networks. Education increasingly proves to be a driver of systemic and lasting transformations in the Amazon region, even though we still need to deepen the connections between education and conservation through research and alternatives to development (Lange, 2016).

Finally, we face the challenge of thinking about actions that promote degrowth (Azam, 2019), slowing down the economy to recognize nature as the holder of rights (Solón, 2019). "This involves recognizing and investing in other worldviews and practices that have been considered 'underdeveloped' in the construction of more diverse societies"³ (Maciel et al., 2022, p. 15).

The promotion of comprehensive and meaningful education for the children and youth of the region involves strategies to strengthen identities, belonging, and the development of a citizenship committed to and grounded in Amazonian existence and resistance. There is no way to preserve what is not known and valued, which is why it is the role of education to recover humanity not separated from the "whole," but as authentic human life which allows for permanence on Earth (Oliveira; Tedesco; Vasconcelos, 2024).

In this sense, contextualized curricula and teaching methods are necessary to prepare students to promote sustainability. Education for sustainability should encompass the main pillars (social, economic, and environmental), including all peoples, human and non-human, and forms of life in the Amazonian territory.

Education has the potential to prepare youths for the significant transformations we need to make in how we relate to the forest, and for that, youths need to be ready to work with new ways of engaging with the forest (bioeconomy, carbon markets, agroforestry systems, etc.).

These dimensions need to be present in the curricula and in the everyday pedagogical practices of schools and educational networks in the region. In this way, education contributes to effective forestality, resilience, and a disruptive and critical mindset. In this case, the words of Bell Hooks (2017) resonate, advocating for an education which can transgress the "normal" and the established in the practice of freedom.

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³ "Trata-se de reconhecer e investir em outras cosmóvisões e práticas que foram tomadas como 'subdesenvolvidas' para a construção de sociedades mais diversas"

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